

Daimler Chrysler AG

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Patent Claims

1. A control system (1) for a motor vehicle, having
- a manual actuating means (3) with a plurality of
- 10 degrees of freedom of adjustment for selecting and/or activating entries in a menu structure with a plurality of menu levels and
- a screen display (2) having a plurality of display areas (210 to 250) for displaying the menu structure,
- 15 the display areas (210 to 250) each comprising at least one field for displaying one of the entries (1.1 to 5.7),
- characterized in that,
- in an active display area (210 to 250) in at least one
- 20 menu level,
- a first and/or a second of the plurality of degrees of freedom of adjustment of the manual actuating means (3) for selecting and/or activating one of the entries (1.1 to 5.7) corresponds to an
- 25 orientation of the entries (1.1 to 5.7) displayed in an active display area, and
- a third and/or a fourth degree of freedom of adjustment of the manual actuating means (3) for exiting the active display area (210 to 250) is
- 30 respectively orthogonal to the orientation of the displayed entries (1.1 to 5.7).

2. The control system as claimed in claim 1,
- 35 characterized by a fifth and/or sixth degree of freedom of adjustment of the manual actuating means (3) for redundantly selecting the at least one entry (1.1 to 5.7) displayed in the active display area (210 to 250).

3. The control system as claimed in claim 1 or 2, characterized in that the fields with the entries (1.1 to 5.7) are arranged with a vertical orientation in a y direction and/or with a horizontal orientation in an x direction in the individual display areas (210 to 250).

4. The control system as claimed in claim 3, characterized in that when the entries (1.1 to 5.7) are oriented vertically in the active display area (210 to 250),

- the first degree of freedom of adjustment is pushing the manual actuating means (3) in the positive y direction,

- the second degree of freedom of adjustment is pushing the manual actuating means (3) in the negative y direction,

- the third degree of freedom of adjustment is pushing the manual actuating means (3) in the positive x direction,

- the fourth degree of freedom of adjustment is pushing the manual actuating means (3) in the negative x direction,

- the fifth degree of freedom of adjustment is rotating the manual actuating means (3) in the clockwise direction about a z axis which is perpendicular to the xy plane, and

- the sixth degree of freedom of adjustment is rotating the manual actuating means (3) in the counter clockwise direction about the z axis.

5. The control system as claimed in claim 3 or 4, characterized in that when the entries (1.1 to 5.7) are arranged horizontally in the active display area (210 to 250),

- the first degree of freedom of adjustment is pushing the manual actuating means (3) in the positive x direction,
- the second degree of freedom of adjustment is pushing the manual actuating means (3) in the negative x direction,
- the third degree of freedom of adjustment is pushing the manual actuating means (3) in the positive y direction,
- the fourth degree of freedom of adjustment is pushing the manual actuating means (3) in the negative y direction,
- the fifth degree of freedom of adjustment is rotating the manual actuating means (3) in the clockwise direction about a z axis which is perpendicular to the xy plane, and
- the sixth degree of freedom of adjustment of the manual actuating means (3) is rotating the manual actuating means (3) in the counter clockwise direction about the z axis.

6. The control system as claimed in one of claims 1 to 5, characterized in that the activation of that selected entry (1.1 to 5.7) of the active display area (210 to 250) which is assigned to an application or a function or a subfunction or an option is carried out by means of a seventh degree of freedom of adjustment of the manual actuating means (3).

7. The control system as claimed in one of claims 1 to 6, characterized in that the activation of that entry (1.1 to 5.7) in one of the display areas (210 to 250) which is assigned to a status display is carried out as a function of a current system state which is determined by a control and evaluation unit (3) and is determined by evaluating signals of vehicle systems (5).

8. The control system as claimed in one of claims 3 to 7, characterized in that when there are a plurality of entries (1.1 to 5.7) in a display area (210 to 250), the width of the individual fields when the entries  
5 (1.1, 2.1 to 2.5, 3.1 to 3.4, 4.1 to 4.3, 5.1 to 5.7) are arranged horizontally is dependent on the length of the respective entry (1.1, 2.1 to 2.5, 3.1 to 3.4, 4.1 to 4.3, 5.1 to 5.7), and when the entries (3.2.1 to 3.2.3) are arranged vertically said width is dependent  
10 on the length of the longest entry (3.2.1 to 3.2.3).

9. The control system as claimed in one of claims 3 to 8, characterized in that the field width when the entries (1.1, 2.1 to 2.5, 3.1 to 3.4, 4.1 to 4.3, 5.1  
15 to 5.7) are arranged horizontally is dependent on the number of entries (1.1, 2.1 to 2.5, 3.1 to 3.4, 4.1 to 4.3, 5.1 to 5.7) to be displayed in this display area (210 to 250).

20 10. The control system as claimed in one of claims 1 to 9, characterized in that the screen display (2) has at least a first display area (210, 220, 240, 250) with a constant graphic basis structure over all the menu levels of the menu structure.

25 11. The control system as claimed in one of claims 1 to 10, characterized in that the screen display (2) has at least a second display area (230) with a graphic basis structure which is variable as a function of an  
30 active menu level of the menu structure.

12. The control system as claimed in claim 10 or 11, characterized in that, in order to display a first menu level of the menu structure on the screen display (2),  
35 a plurality of separate, vertically arranged display areas (210, 220, 230, 240, 250), at least one of which can be activated, are provided.

13. The control system as claimed in one of claims 10 to 12, characterized in that, when an entry (1.1, 2.1 to 2.5, 5.1 to 5.7) of an active display area (210, 220, 250) is activated in the individual menu levels of the menu structure, a submenu (220.1, 230.1 to 230.11, 240.1) which is dependent on the activated entry (1.1, 2.1 to 2.5, 5.1 to 5.7) is opened in at least one further level of the menu structure, and by activating at least one of the display areas (210 to 250) it can be displayed in said area.

14. The control system as claimed in claim 13, characterized in that the opened submenu (220.1, 230.1 to 230.11, 240.1) can be displayed in the active display area (210, 220, 230, 240, 250) and in at least one other of the display areas (210, 220, 230, 240, 250) by means of an overlap of the graphic basic structure.

15. The control system as claimed in claims 13 or 14, characterized in that a plurality of the submenus (220.1, 230.1 to 230.11, 240.1), preferably two, can be displayed simultaneously on the screen display (2) in the at least one further submenu of the menu structure.

16. The control system as claimed in claim 15, characterized in that the plurality of submenus (220.1, 230.1 to 230.11, 240.1) can be displayed with entries orientated vertically one next to the other.

17. The control system as claimed in claim 14 or 15, characterized in that a first of the plurality of submenus (220.1, 230.1 to 230.3, 230.4, 230.6, 230.7 to 230.11, 240.1) is opened and displayed in the first menu level of the menu structure as a function of an activation of an entry (1.1 to 5.7), and a second of the plurality of submenus (230.2, 230.5, 230.7) is opened and displayed as a function of an activation of

an entry in the associated first submenu (230.1, 230.4, 230.6).

18. The control system as claimed in claim 17,  
5 characterized in that all the opened submenus are  
closed simultaneously by means of a pushing movement of  
the manual actuating means (3) orthogonally with  
respect to the orientation of the entries of the active  
10 submenu (230.2, 230.5, 230.7) away from the adjacent  
submenu (230.1, 230.4, 230.6), and in that only the  
active submenu is closed by means of a pushing movement  
of the manual actuating means (3) orthogonally with  
respect to the orientation of the entries of the active  
15 submenu (230.2, 230.5, 230.7) in the direction of the  
adjacent submenu (230.2, 230.4, 230.6), and the  
adjacent submenu is activated for a new selection of an  
entry.

19. The control system as claimed in one of claims 12  
20 to 18, characterized in that the number and/or the  
graphic display and/or contents of the entries to be  
displayed in the display areas (210 to 250) are  
variable and/or constant as a function of current  
system states and/or of a current menu level and/or of  
25 a currently activated application.

20. The control system as claimed in claim 19,  
characterized in that a presettable application can be  
displayed in at least one (250) of the first display  
30 areas (210, 220, 240, 250), the number and the position  
of the entries to be displayed being constant as a  
function of the preset application, and the contents  
and the graphic display of the entries (5.1 to 5.7) to  
be displayed being variable and/or constant as a  
35 function of current system states.

21. The control system as claimed in claim 19 or 20,  
characterized in that at least one (210) of the first

display areas (210, 220, 240, 250) is configured as a status bar with at least one horizontally arranged field for displaying at least one status (1.1), the number, the position, the contents and the graphic display of the entries (1.1) to be displayed being variable as a function of current system states and/or application states.

22. The control system as claimed in claims 19 to 21, characterized in that at least one (220) of the first display areas (210, 220, 240, 250) is configured as an application line for displaying an application group with various selectable and predefinable applications (2.1 to 2.n), in particular of an audio application, navigation application, communications application, video application and vehicle application, the number and position of the entries (2.1 to 2.n) to be displayed being constant, and the graphic display of the entries (2.1 to 2.n) to be displayed being variable as a function of an activated application.

23. The control system as claimed in one of claims 19 to 22, characterized in that at least one of the second display areas (230) is configured as an application area for displaying details and controlling a selected and activated application, the number and the position and the graphic display of the entries (3.1 to 3.n) to be displayed being dependent on the activated application.

24. The control system as claimed in one of claims 19 to 23, characterized in that at least one (240) of the first display areas (210, 220, 240, 250) is configured as a subfunction line for displaying and selecting functions and/or subfunctions and/or options of an activated application, the number and the position and the graphic display of the entries (4.1 to 4.n) to be displayed being dependent on the activated application.



25. The control system as claimed in one of claims 1 to 24, characterized in that a cursor can be moved over the screen display (2) by the manual actuating means  
5 (3) in order to select at least one entry displayed on the screen display (2).

26. The control system as claimed in claim 25,  
10 characterized in that a graphic display of the cursor is variable as a function of the active display area and/or of an active application and/or of active menu level.

27. The control system as claimed in claim 25 or 26,  
15 characterized in that the cursor can be displayed graphically as an independent object (232) on the screen display (2) or by changing the graphic display of a currently selected field (1.1 to 5.7).

20 28. The control system as claimed in claim 27, characterized in that a field which is selected with a cursor changes its coloured display and/or its shape and/or its size.

25 29. The control system as claimed in claim 27 or 28, characterized in that a coloured display and/or a shape and/or a size of the cursor can be changed as an independently graphically displayed object (232) on the screen.